

COAL MINING AND STREAMS: JUST SOME THOUGHTS BASED ON WHAT I'VE LEARNED

Mid-Atlantic Stream Restoration Conference
Rocky Gap, Maryland

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November 16, 2011



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OVERVIEW

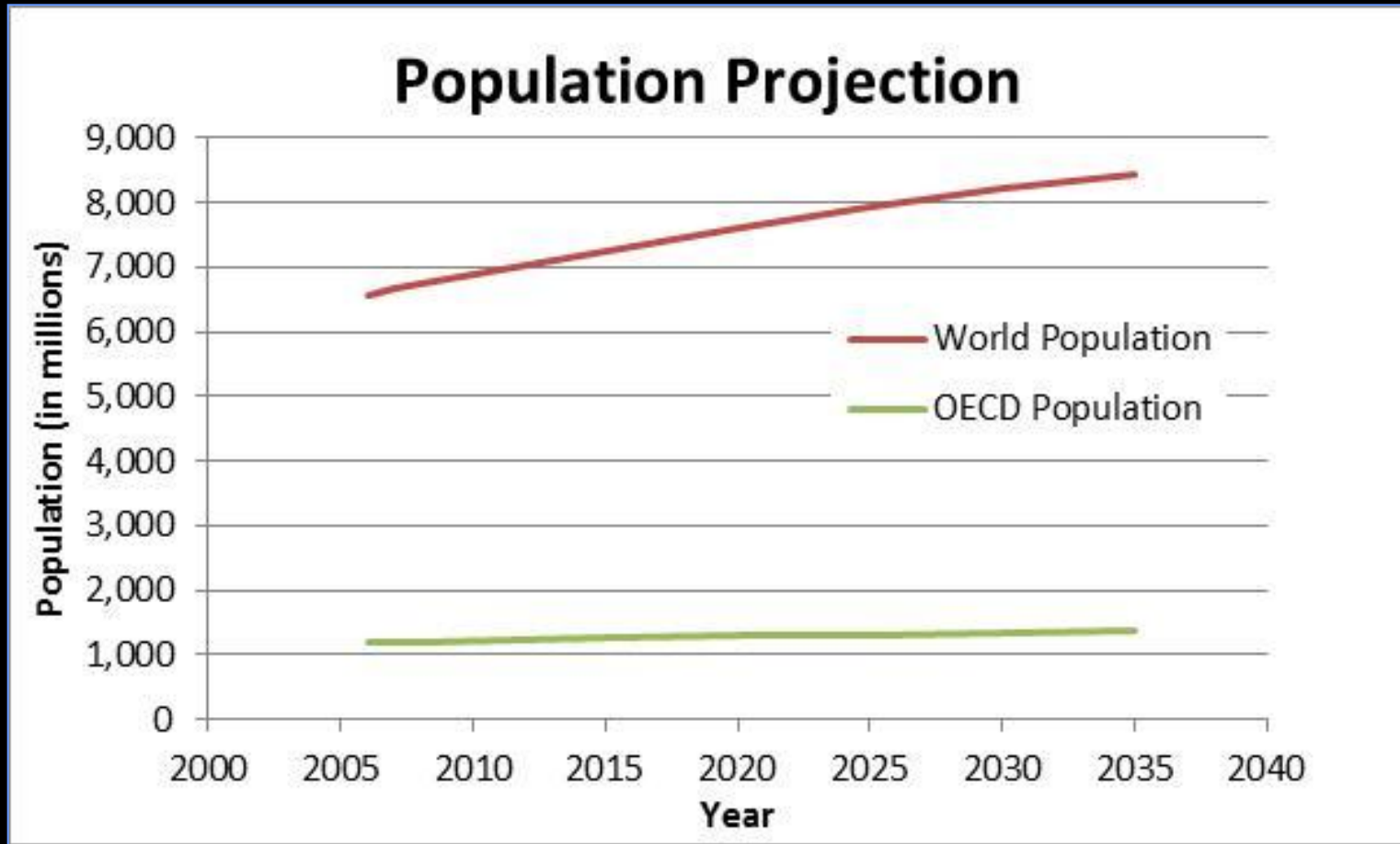
OBJECTIVE: To highlight needs of an emerging market AND to discuss the role of the practitioner.

- Energy Consumption Trends
- Coal Mining Basics
- Impacts to Streams
- Policy
- Reclamation, Remediation and Mitigation



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ENERGY CONSUMPTION TRENDS

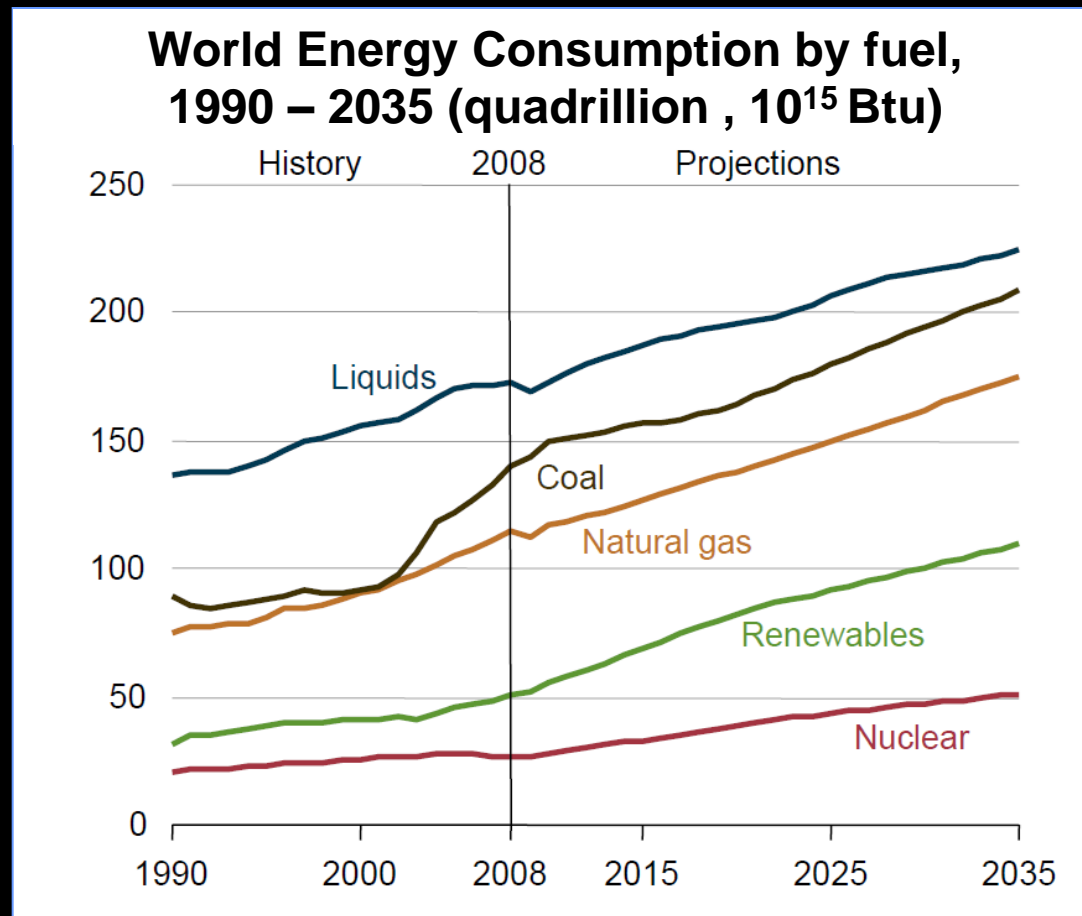


- Population Projection (data from US Energy Information Association “International Energy Outlook, 2011”, DOE/EIA-0484)



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ENERGY CONSUMPTION TRENDS



- Population Projection (data from US Energy Information Association “International Energy Outlook, 2011”, DOE/EIA-0484)



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COAL MINING BASICS

- **Strip mining** (credit International Mining)



- **Contour mining** (credit Kentucky Division of Mine Permits)
- **Mountaintop removal mining** (credit EPA)



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IMPACTS TO STREAMS

Temporary and Permanent Disturbances Include:

- Acid Drainage (AMD)
- Metal Contamination
- Sedimentation
- Cyanide



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POLICY

- Surface Mining Control and Reclamation Act (SMCRA)
- Clean Water Act (CWA)
- EPA's July 21, 2011 Final Memorandum:
“Improving EPA Review of Appalachian Surface Coal Mining Operations Under the Clean Water Act, National Environmental Policy Act, and the Environmental Justice Executive Order”



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REMEDIATION EXAMPLE

Lick Creek (unnamed tributary)

- Client: USACE
- Location: Ridge and Valley, VA
- Scope: Remediate existing AMD treatment pond



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REMEDIATION EXAMPLE



Conventional: EQ Basin, SAPS cells,
Constructed Treatment Wetland.

Overloaded by increased Q from historic
room and pillar



REMEDIATION EXAMPLE



- Following report of fish kill, performed Emergency Response.
- Temporary and permanent stabilization



RECLAMATION EXAMPLE

Big Brush (unnamed tributary)

- Client: Lexington Coal
- Location: Cumberland Plateau, TN
- Scope: Reclaim valley fill associated with historic room and pillar mining operation



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RECLAMATION EXAMPLE

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RECLAMATION EXAMPLE

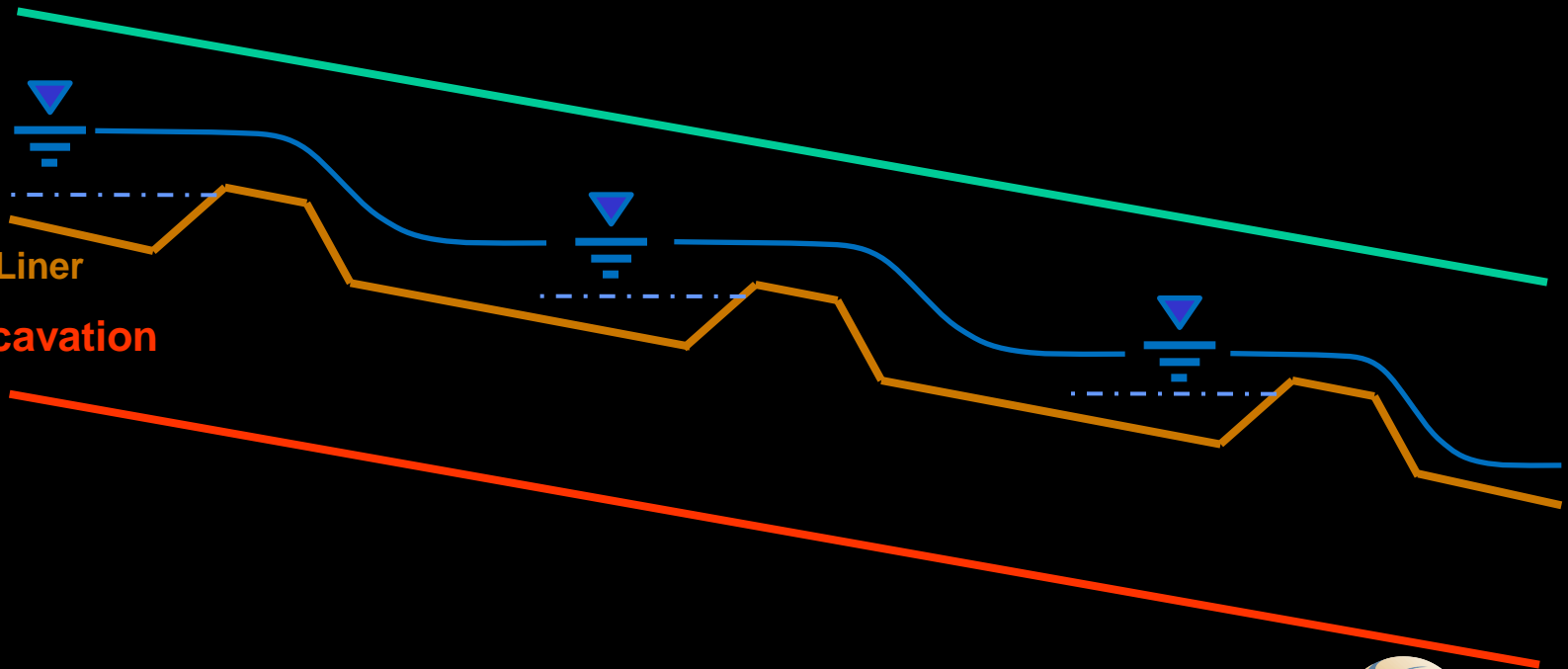
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Design Strategy

Average Valley Slope

Bentonite Liner

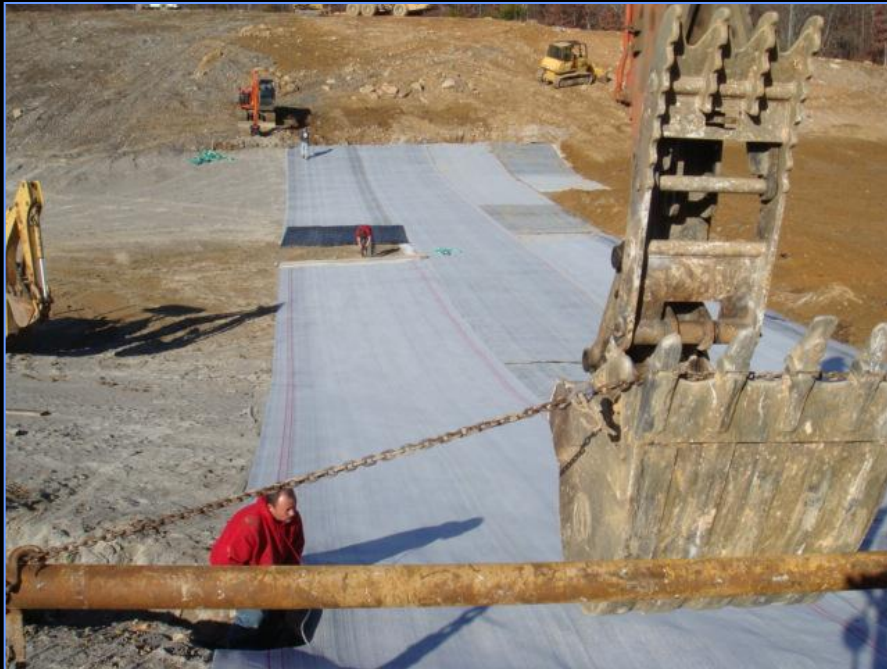
Mining Excavation



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RECLAMATION EXAMPLE

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RECLAMATION EXAMPLE

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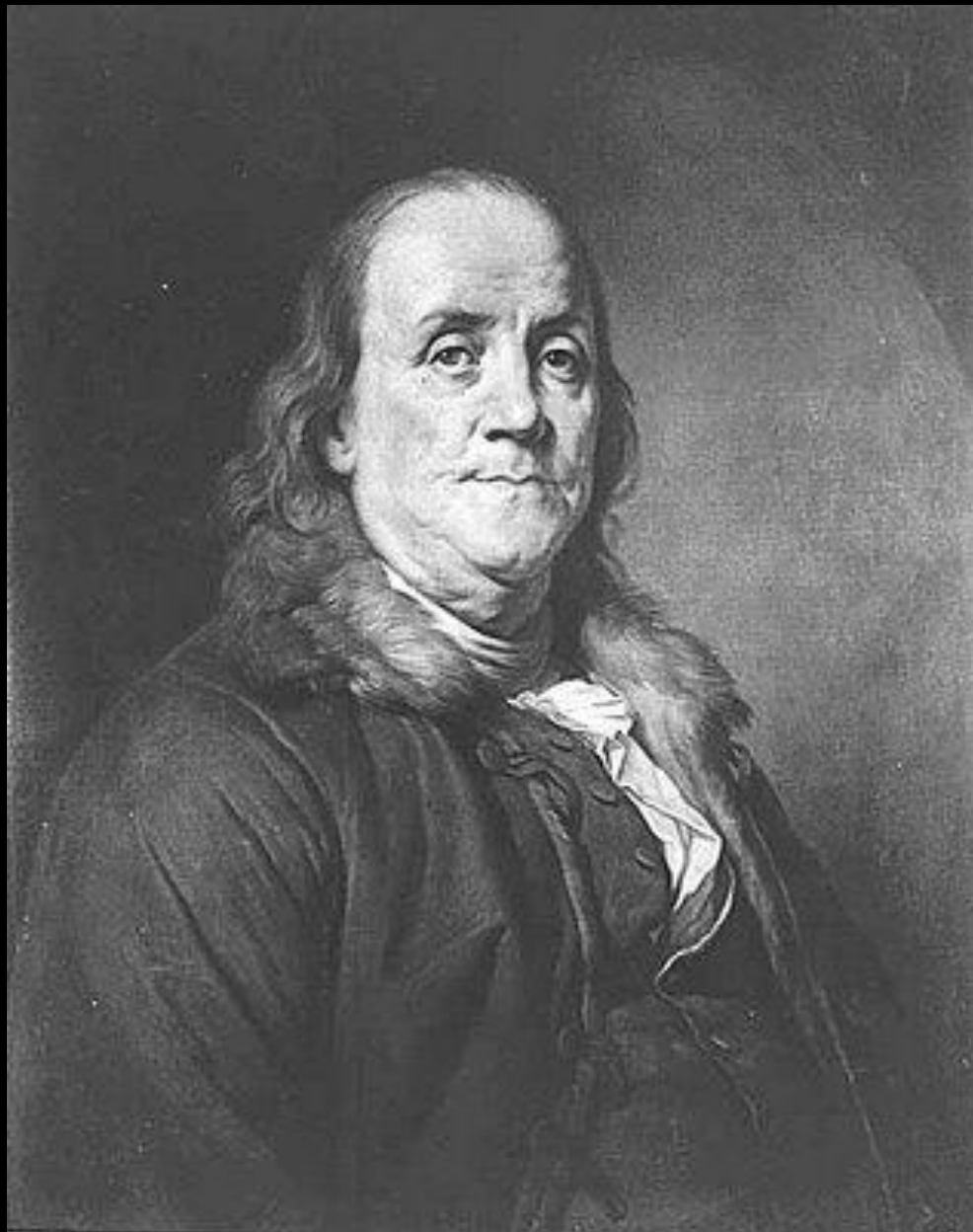
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MITIGATION EXAMPLE

Lower Coldwater Fork
Sands Hill Mitigation
Rosebud
Oxford Mine



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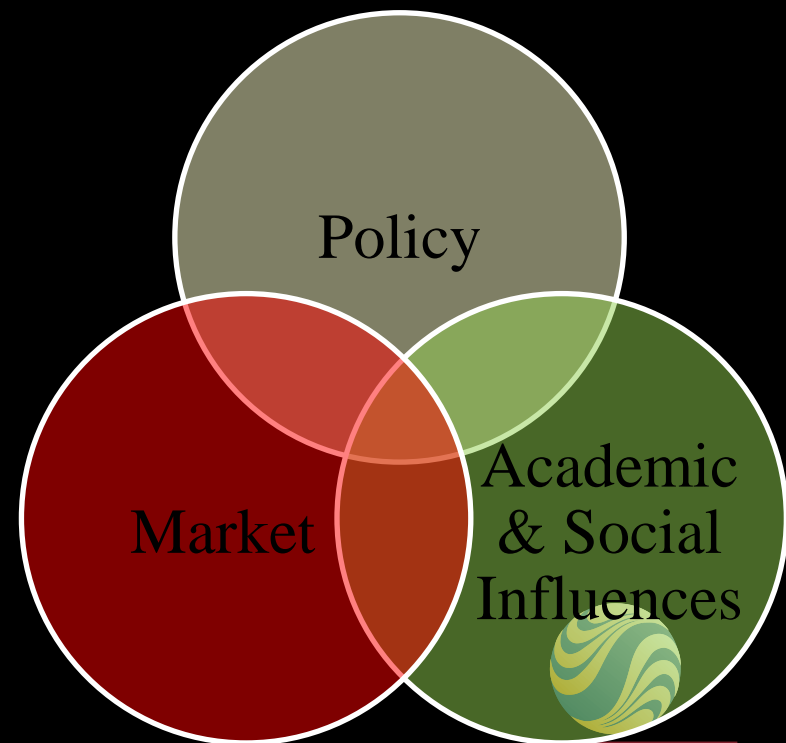


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ROLE OF PRACTICIONER

- Social and technical paradigms are shaped by:
 - Generally acceptable to society
 - Policy and guidance
 - Market responses
- Some paradigms in stream restoration include:
 - Definition of restoration
 - Stream behavior
 - Design philosophy
 - Technical methodology



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